Proposed Item for Biobased Designation

The following biobased product information has been collected to support item designation by USDA for the Federal Biobased Product Preferred Procurement Program (FB4P). This summary reflects data available as of July 25, 2006.

Title: Biofluid Filled Transformers

Description: Electro-mechanical equipment used to handle electrical power, filled with eco-friendly biobased fluid.

Manufacturers Identified: 5 manufacturers producing Biofluid Filled Transformers have been identified through internet searches, manufacturer's directories, trade associations, and company submissions.

Industry Associations Investigated: The following industry associations have been investigated for member companies producing Biofluid Filled Transformers:

- Western Area Power Administration
- The Transformer Association
- Power Sources Manufacturers Association
- Institute of Electrical and Electronics Engineers (IEEE)
- American Public Power Association (APPA)
- Independent Lubricant Manufacturers Association

Commercially Available Products Identified: Of the manufacturers identified, 12 Biofluid Filled Transformers are commercially available on the market.

Product Information Collected: Specific product information including company contact, intended use, biobased content, and performance characteristics have been collected on 5 Biofluid Filled Transformers.

Industry Performance Standards: Product information submitted by biobased manufacturers indicate that have typically been tested to the following industry standards:

- American Society for Testing and Materials: ASTM D 92- Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- EPA OPPTS 835.3100- Aerobic Aquatic Biodegradation
- Factory Mutual Standard 3990- Less or Nonflammable Liquid-Insulated Transformers
- Fire Hazard Rating Underwriter's Laboratories Standard 340- Standard of safety for test for comparative flammability of liquids
- National Electric Code Section 450-23
- National Electric Safety Code (Accredited Standards Committee C2) Section 15- Transformers and Regulators
- Organization for Economic Co-operation and Development: OECD G.L. 203
- Occupational Safety and Health Administration: article 1910.305 section 5(v)

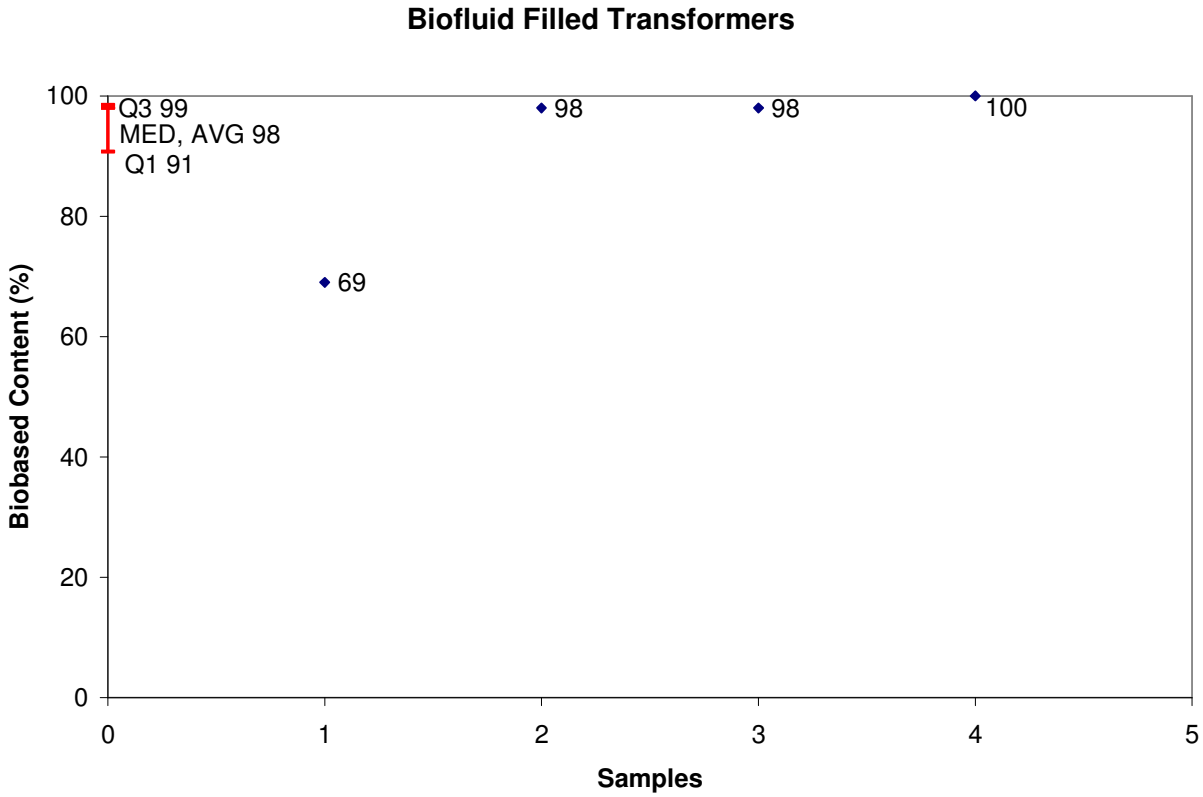
Samples Tested for Biobased Content: 2 samples of Biofluid Filled Transformers have been submitted to independent laboratories for biobased content testing as specified by ASTM standard D6866-04.

Biobased Content Data: Results from biobased content testing of Biofluid Filled Transformers indicate a range of content percentages from 69% minimum to 98% maximum biobased content as defined by ASTM D 6866-04. A detailed distribution of biobased content levels is included as Appendix A.

Products Submitted for BEES Analysis: Life-cycle cost and environmental effect data for 2 Biofluid Filled Transformers have been submitted to NIST for BEES analysis.

BEES Analysis: The life-cycle costs of the submitted Biofluid Filled Transformers range from $8.50 minimum to $9.10 maximum per usage unit. The environmental scores range from 0.0198 minimum to 0.0581 maximum. A detailed summary of the BEES results is included as Appendix B.

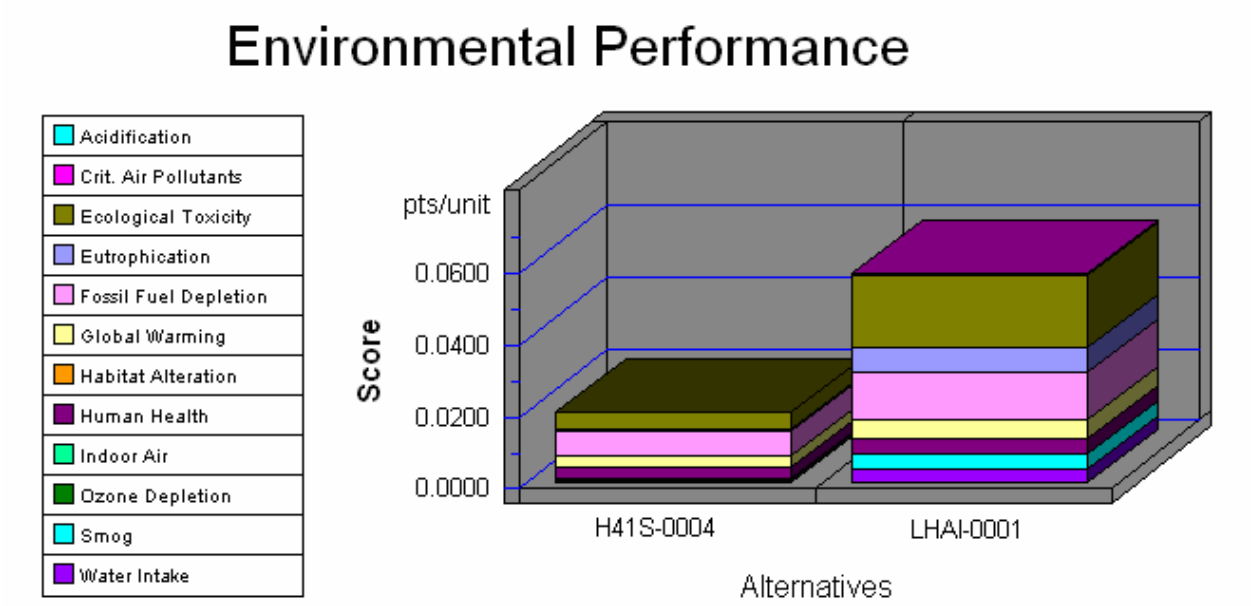
Appendix A - Biobased Content Data



	Manufacturers Identified	Products Identified	C14	BEES
1	RGWJ	RGWJ-0058	69	
2	H41S	H41S-0004	98	yes
3	JY3G	JY3G-0055	98	
4	LHAI	LHAI-0001	100	yes

Appendix B - BEES Analysis Results

Units: 1 Gallon of Transformer Fluid

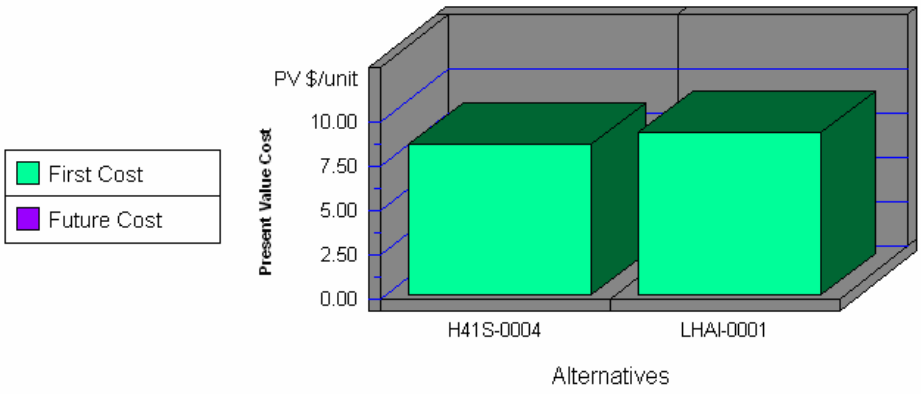


Note: Lower values are better

Category	H41S-0004	LHAI-0001
Acidification--5%	0.0000	0.0000
Crit. Air Pollutants--6%	0.0002	0.0003
Ecolog. Toxicity--11%	0.0046	0.0204
Eutrophication--5%	0.0007	0.0066
Fossil Fuel Depl.--5%	0.0066	0.0130
Global Warming--16%	0.0033	0.0052
Habitat Alteration--16%	0.0000	0.0000
Human Health--11%	0.0029	0.0047
Indoor Air--11%	0.0000	0.0000
Ozone Depletion--5%	0.0000	0.0000
Smog--6%	0.0007	0.0040
Water Intake--3%	0.0008	0.0039
Sum	0.0198	0.0581

Appendix B (continued)

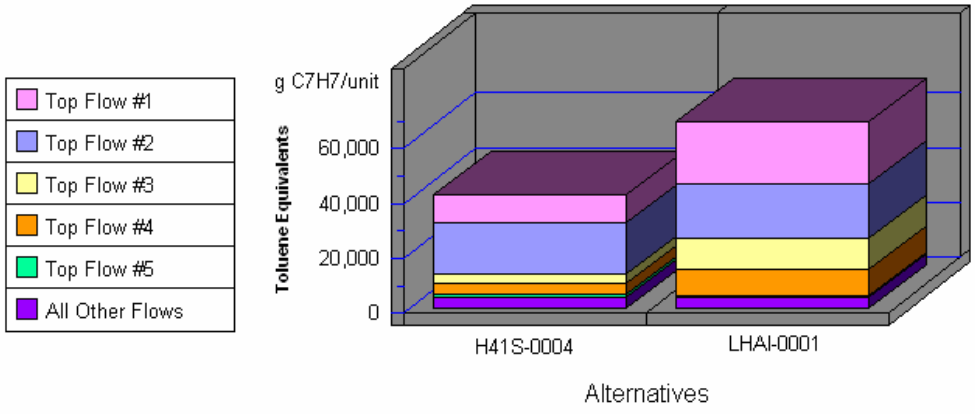
Economic Performance*



Category	H41S-0004	LHAI-0001
First Cost	8.50	9.10
Future Cost-- 3.9%	0.00	0.00
Sum	8.50	9.10

*No significant/quantifiable performance or durability differences were identified among competing alternatives. Therefore, future costs were not calculated.

Human Health by Sorted Flows*



Note: Lower values are better

Category	H41S-0004	LHAI-0001
Cancer--(w) Arsenic (As3+, As5+	10,360.69	22,889.89
Cancer--(w) Phenol (C6H5OH)	18,441.40	19,804.46
Cancer--(a) Dioxins (unspecifie	3,794.80	11,372.92
Cancer--(a) Arsenic (As)	3,483.45	9,582.97
Cancer--(a) Benzene (C6H6)	1,586.72	774.37
All Others	4,037.38	4,001.27
Sum	41,704.43	68,425.88

*Sorted by five topmost flows for worst-scoring product